REMARKS/ARGUMENTS

Reconsideration of the subject application is requested. Claims 1-23 remain in the application, with claims 8-23 having been withdrawn from consideration. Claim 1 has been amended to specify that the planarizing step leaves at least a portion of the buffer layer on the etch stop layer. This amendment clarifies an inherent feature of the claim, since at least a portion of the buffer layer must remain after the planarizing step in order to perform the subsequent etching step. The portion of the buffer layer that remains after the planarizing step is illustrated as item 56 in FIG. 6 of the application. Claim 1 has been further amended to improve the clarity of the claim by changing the phrase "the surface of the wafer" to "the surface of the layer of bottom shield material". The Applicants request entry of the amendments to claim 1, since they merely clarify the language of the claim and do not raise new issues.

The Applicants acknowledge that claims 22 and 23 have been withdrawn from consideration as being directed to a non-elected invention.

In Section 1 of the Detailed Action portion of the Office Action, the specification has been objected to for failing to provide proper antecedent basis for the phrase "the surface of the wafer" in line 5 of claim 1. This objection has been addressed by the editorial change to claim 1, wherein the phrase "the surface of the wafer" has been changed to "the surface of the layer of bottom shield material".

In Section 3 of the Detailed Action portion of the Office Action, claims 1, 2 and 5-7 have been rejected under 35 U.S.C. 102(b) as being anticipated by Bussmann et al. (CPP Giant Magnetoresistance of NiFeCo/Cu/CoFe/Cu Multilayers).

Bussmann et al. has been cited as teaching (Fig. 2) a process for manufacturing a magnetic sensor for a disk drive comprising steps of: fabricating a giant magnetoresistive stack on a surface of a layer of bottom shield material, the giant magnetoresistive stack including an etching stop layer (exposed surface after RIE etching process to form the GMR) and a buffer layer on the top of the etching stop layer as shown in Fig. 1 (a) and (b); depositing an insulating material on the giant magnetoresistive stack and the surface of a layer of bottom shield material; planarizing the insulating material to form a

top surface of the insulating material lying in a plane; etching the buffer layer as shown in Fig. 2 (c); and depositing a top shield layer on the insulating material and the giant magnetoresistive stack, the top shield layer making electrical contact with the giant magneto resistive stack as shown in Fig. 2 (d) (see also page 924 and 925). As per claim 2, Bussmann et al. was cited as showing that planarizing the insulating material is performed by the chemical machining process (CMP). As per claim 5, Bussmann et al. was cited as showing that the insulating material is made of nitride. As per claim 6, Bussmann et al. was cited as showing that the stop layer exposed surface after RIE etching process to form the GMR is made of copper. As per claim 7, Bussmann et al. was cited as showing that the buffer layer is made of nitride.

This rejection is traversed. It is respectfully submitted that the present invention as defined by amended claim 1 contains features that are neither disclosed nor suggested by the cited reference. In particular, claim 1 includes the step of planarizing the insulating material to form a top surface of the insulating material lying in a plane adjacent to or passing through the buffer layer, leaving at least a portion of the buffer layer on the etch stop layer. Claim 1 further requires that the portion of the buffer layer is etched to the etch stop layer.

The Bussmann et al. process does not planarize the insulating material to form a top surface of the insulating material lying in a plane adjacent to or passing through the buffer layer, leaving at least a portion of the buffer layer on the etch stop layer, as is required in claim 1. Bussmann et al. uses a chemical mechanical process (CMP) to open the top layer of the magnetic device (see the first paragraph in the second column of page 925). The present invention avoids opening the top layer of the magnetic device during the planarizing step by leaving at least a portion of the buffer layer on the etch stop layer. The Bussmann et al. process relies on control of the CMP to determine the distance between the shields (that is, the sensor thickness). As discussed in the Background section of the present application, on pages 3 and 4, it is difficult to determine when to stop a CMP process. In addition, since Bussmann et al. does not stop the planarizing step to leave a portion of the buffer layer on the etch stop layer, Bussmann et al. does not disclose or suggest a step of etching the buffer layer to the etch stop layer as is required in claim 1.

In the present invention, the sensor thickness depends on the processes used to deposit the films and the ability of the etch to stop at the etch stop layer. The present invention planarizes the sample and etches back the buffer layer to the etch stop layer. This provides precise control of the sensor thickness. The Bussmann et al. process does not provide such precise control of the sensor thickness.

Claims 2 and 5-7 depend from claim 1 and therefore also include these features.

In Section 5 of the Detailed Action portion of the Office Action, claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bussmann et al. in view of Thomas et al. (US PAT. 6,483,662).

Bussmann et al. has been cited as teaching the limitations as set forth above except for using a vacuum etching process for planarizing insulating material. Thomas et al. has been cited as teaching a method of making a magnetoresistive element including a process of planarizing insulating material by either CMP or other suitable etching process such as focused ion beam for planarizing the material surface to a fine level (col. 6, lines 3-25). Therefore, it was considered to have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a process of planarizing insulating material of Bussmann et al. by a vacuum etching process such as focused ion beam as taught by Thomas et al. for the purpose of planarizing the material surface to a fine level.

Since claim 3 depends from claim 1, this rejection is traversed for the reasons set forth above with respect to the traversal of the rejection of claim 1, and for the following reasons. The Applicants' respectfully submit that it would not have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a process of planarizing insulating material of Bussmann et al. by a vacuum etching process such as focused ion beam as taught by Thomas et al.

Bussmann et al. specifically requires the use of a chemical mechanical process (CMP) to open the top layer of the magnetic device (see the first paragraph in the second column of page 925). The substitution of a vacuum etch process for the CMP process of Bussmann et al. would be contrary to the express teachings of Bussmann et al. There is no suggestion in the Bussmann et al. and Thomas et al. references that their

teachings can be combined.

In Section 6 of the Detailed Action portion of the Office Action, claim 4 has been indicated to be allowable if rewritten in independent form. However, in view of the above discussion, such rewriting is not believed to be necessary.

On February 24, 2004, in a telephonic interview between Robert P. Lenart and Examiner Paul D. Kim, the Bussmann et al. reference was discussed with respect to claim 1. The Applicants' attorney asserted that Bussmann et al. opens the top of the stack using a chemical mechanical polishing process, while the Applicants' invention uses an etch process to open the top of the stack. The outcome of the interview is set forth in the Interview Summary Form completed by the Examiner.

All claims in the application are believed to be in allowable form. Allowance of the application is requested.

Respectfully submitted,

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